



MEMORANDUM

To: M. Morash, EPA

Copy To:

From: J. Lambert, J. Brunelle

Subject: Olin Chemical: Benzo(a)pyrene distribution and surface water impacts

Date: 7/20/2020

On July 9, 2020, the U.S. Environmental Protection Agency (EPA) requested an evaluation of the potential sources of benzo(a)pyrene (BaP) in the Off-Property West Ditch Stream at the Olin Chemical Superfund Site (the Site). Potential sources of contamination include the following:

- Disposal of material from the Plant C area
- Boiler and other emissions from the Plant C area
- Railroad ties and emissions associated with train traffic
- Impacts from other active facilities/pavement run-off
- Groundwater impacts

Figure 1 and Figure 2 provide available BaP data for soil/sediment and surface/groundwater, respectively. Figure 3 combines Figure 1 and 2 into one presentation.

Soil and sediment data were compared to the November 2019 industrial Regional Screening Level (RSL) for BaP (2,100 µg/kg), which is generally comparable to the Massachusetts Department of Environmental Protection (MassDEP) criterion for “natural” soil (2,000 µg/kg) (MassDEP, 2016) and the S-1/GW-1 soil criteria (2,000 µg/kg). Groundwater and surface water data were compared to the surface water preliminary remediation goal (PRG) (0.9 µg/L).

Disposal of material from the Plant C area:

According to a 1969 Pollution Control Study (Smith, 1997, section 1.3.1) the combined liquid waste stream to Lake Poly included cooling tower and boiler blowdown as well as uncontaminated cooling water. While some of the wastewater migrated to the subsurface from the bottom of Lake Poly, some overflowed directly into the ditch system.

The former On-Property West Ditch Stream received overflow from the former Lake Poly area. Liquids entering the On-Property West Ditch Stream would flow toward the South Ditch and from there, exit the Olin property.

Plate 1-2 from the Smith (1997) report (Attachment A) shows the drainage and other features prior to cap construction, including surface water flow directions. Based on the surface water features shown and the presence of an elevated railroad spur that parallels the Olin property almost the entire length of the property line, water from the On-Property West Ditch Stream does not appear to have



been connected to the Off-Property West Ditch Stream since the Off-Property West Ditch Stream entered the South Ditch Stream via a culvert and upstream of the On-Property West Ditch Stream.

Surface Impacts from Boiler Operations

Most of the soil concentrations shown in the immediate vicinity of the boilerhouse/Plant C are below the industrial RSL/MassDEP criteria; however, two locations exceeded these criteria, and one sample was more than 10x these criteria. Given the sporadic exceedances, boilerhouse/Plant C operations do not appear to have resulted in significant impacts to soil.

Impacts from Railroad Operations

Data from limited soil samples collected near the railroad tracks west of the Olin property (primarily south of the South Ditch) returned results below 1000mg/kg (less than half of the industrial RSL). Therefore, railroad operations do not appear to be a significant BaP source.

Impacts from Non-Olin Sources

The Off-Property West Ditch Stream serves as drainage for nearby properties along Jewel Drive. Soil sampling was not conducted away from the Olin property to the west, with the exception of limited sampling in the vicinity of the South Ditch. It is unclear if contamination from nearby paved areas or other facilities may have resulted in surface impacts that may have contributed to surface water impacts.

Groundwater Impacts

The figures include groundwater isoconcentration contours for both the PRG and half the PRG in order to depict data trends. BaP was generally not detected in groundwater at the Site. Only one groundwater sample exceeded the 0.9 µg/L PRG for surface water (GW-80, southeast of the area covered by Figure 1 and Figure 2). BaP was detected in groundwater in the vicinity of the Off-Property West Ditch Stream; however, the maximum concentration detected was 0.52 µg/L (also located away from the Olin property). Given the relatively low groundwater concentrations, it is unlikely that the source of contamination in the Off-Property West Ditch Stream is from groundwater impacts, and also unlikely that the existing groundwater concentrations can be attributed to a source on the Olin property.

Conclusion

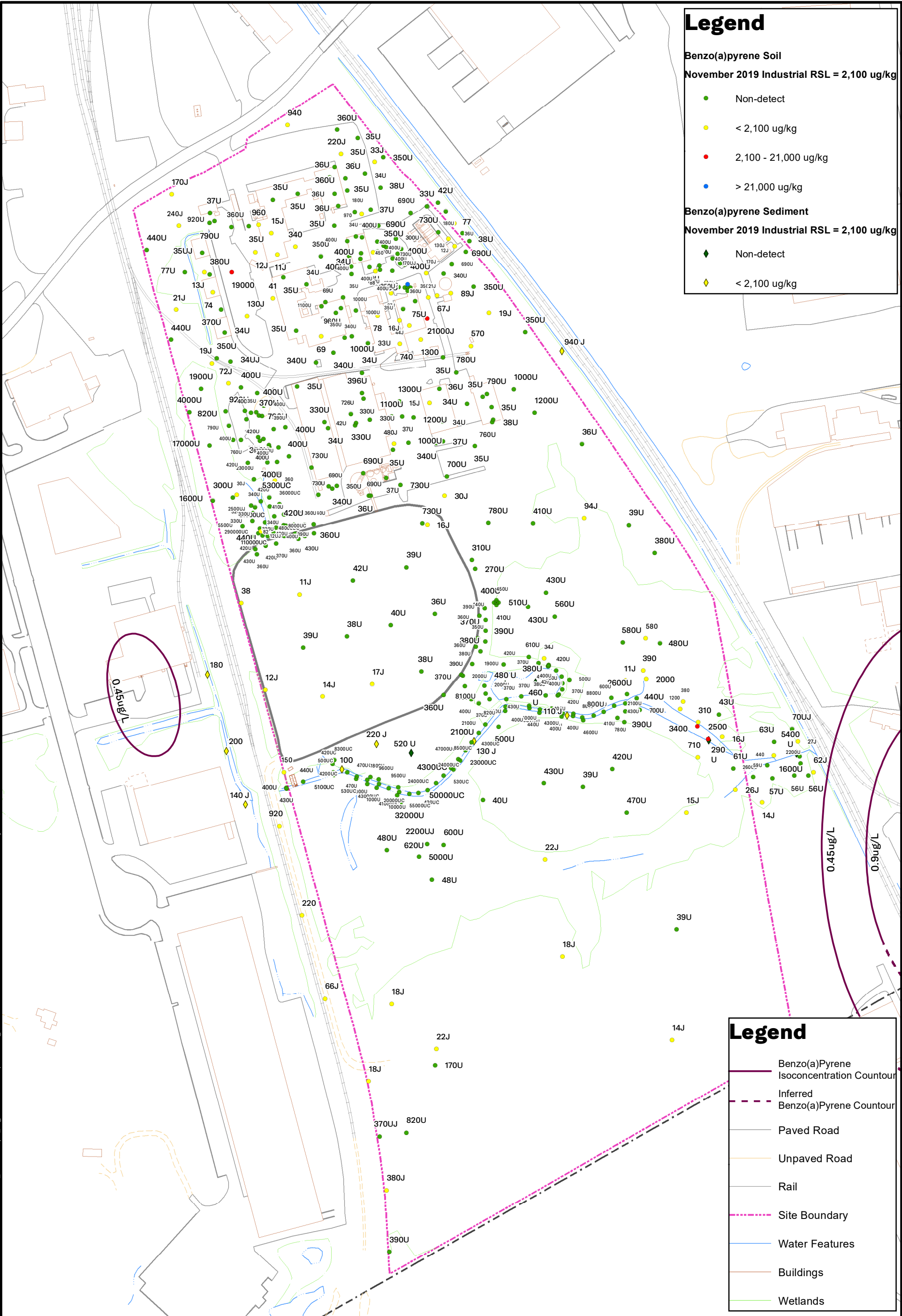
The surface water BaP concentrations in the Off-Property West Ditch Stream do not appear to be directly attributable to a single source either on or off the Olin property. Samples collected from the surrounding groundwater, sediment, and soil do not have elevated BaP concentrations. Additional sampling (such as including BaP in the sample suite for quarterly sampling) may help determine if BaP concentrations are consistent or if the above-mentioned potential source areas are contributing to BaP in the Off-Property West Ditch Stream.



References

MassDEP, 2016. Technical Update: Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil. August.

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0 100 200 400
Feet
1 inch = 200 feet



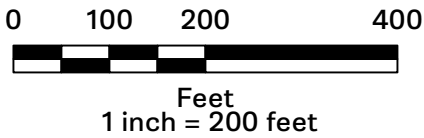
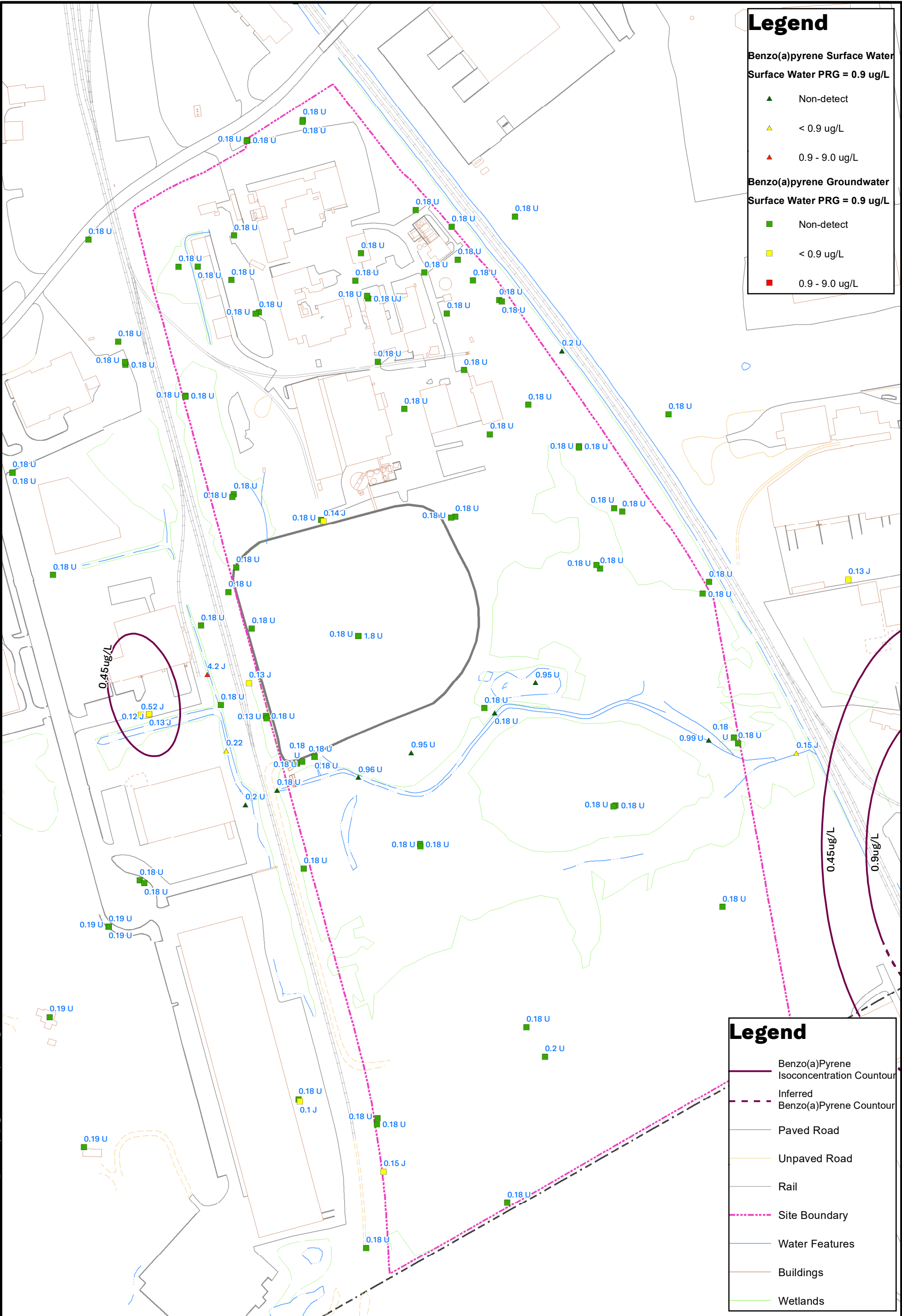
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FIGURE 1

**BENZO(A)PYRENE RESULTS IN SOIL
AND SEDIMENT – ALL SOIL RESULTS
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSASHUSETTS**

PREPARED BY: JRS	CHECKED BY: JML
PROJECT NO. D0001.02	DATE: JULY 2020

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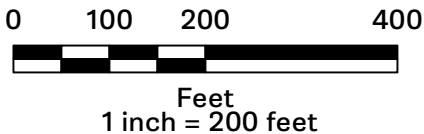
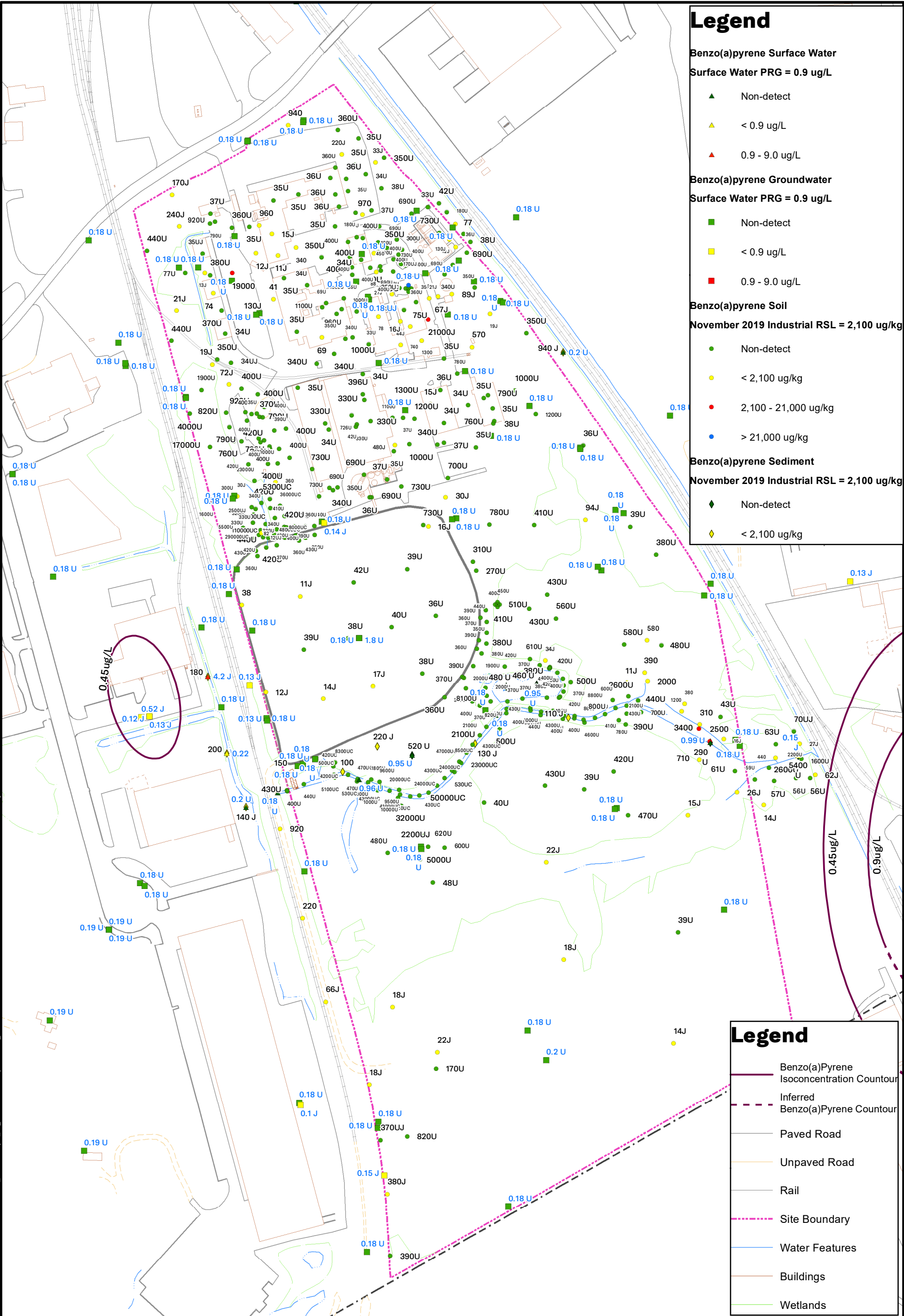
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FIGURE 2

**BENZO(A)PYRENE RESULTS IN GROUNDWATER
AND SURFACE WATER – 2009-2013
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSASHUSETTS**

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PROJECT NO. D0001.02	DATE: JULY 2020

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FIGURE 3

COMBINED BENZO(A)PYRENE
RESULTS IN ALL MEDIA
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSASHUSETTS

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